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Acceptability and Feasibility of a Pain and Depressive Symptoms Management Intervention in Middle-Aged and Older African American Women

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Abstract

Background and Objectives: The intersection of race, gender, and age puts older African American women at high risk of experiencing comorbid pain and depressive symptoms. The purpose of this study was to assess the feasibility and acceptability of a 12-week behavioral activation intervention to target self-selected goals related to pain and depressive symptoms in middle-aged and older African American women.

Research Design and Methods: This randomized waitlist control study included 34 self-identified African American women, 50 years of age or older, with moderate-to-severe chronic pain and depressive symptoms. The intervention consisted of 8 in-person or virtual 1-hour visits with a nurse. Follow-up acceptability assessments were conducted with 10 participants.

Results: The average age of the participants was 64.8 (standard deviation [*SD*] 10.5). They reported an average pain intensity score of 7.0 (*SD* 1.9) out of 10 and an average Patient Health Questionnaire-9 depressive symptoms score of 11.9 (*SD* 4.0) at baseline. Of the 34 participants who consented, 28 (82.4%) women started the intervention and 23 (82.1%) completed the intervention. Participants described the study as useful and beneficial. Participants recommended including a group component in future iterations. Effect sizes at 12 weeks were −0.95 for depressive symptoms indicating a substantial decrease in experienced depressive symptoms, but pain intensity was virtually unchanged (+0.09).

Discussion and Implications: The findings of this study demonstrate that the intervention is acceptable among middle-aged and older African American women and their personal goals were met. Including a group component and identifying effective ways to decrease attrition rates will be key in the next steps of development for this intervention. It is crucial to provide tailored, nonpharmacological approaches to pain, and depression symptom management in older adult populations who experience inequities in pain and mental health outcomes. This study emphasizes the importance of participant-driven goal-setting interventions.

Translational Significance: The findings suggest the need for minor adjustments and a larger-scale efficacy trial to test the Depression and Pain Perseverance through Empowered Recovery intervention. This work provides insight into a pain and depressive symptom management program that if modified and found effective can be scaled to address co-occurring pain and depressive symptoms among women as they age. Improvements in pain and depressive symptoms can lead to better physical function and quality of life in older adults.

Keywords: Aging, Pain management, Mental health

Background and Objectives

Pain and depressive symptoms often co-occur but are typically treated separately in clinical practice. The interaction of comorbid pain and depression has been explored and supported in literature (1–4). However, gaps in knowledge remain regarding interventions to address comorbid pain and depression from the perspective of intersectional identities. Older African Americans are at high risk of experiencing comorbid pain and depressive symptoms. Social determinants of health are driving factors (eg, financial strain, lack

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of access to health care) in underrepresented racial groups such as African Americans that lead to health inequities in pain and these exposures happen over time as they age (5,6). In studies where this intersection was explored, more depressive symptoms are associated with greater pain intensity (7,8). Patil and colleagues found that depression served as a partial mediator in the relationship between pain interference and health behaviors (9).

The intersection of gender identity, race, and age adds further complexity to our understanding and treatment of comorbid pain and depression/depressive symptoms. Few studies have explored this phenomenon in older African American women, highlighting a lack of research on this unique perspective (7). Drazich and colleagues found that older African American women experiencing comorbid pain and depressive symptoms described a link between their pain and depressive symptoms, and how it interfered with their daily lives and their interactions with healthcare providers (10). Various factors contribute to the inequities in pain and mental health outcomes in middle-aged and older African American women that present complexity in treating both conditions. In addition, due to the biological and psychosocial nature of both pain and depressive symptoms, managing these conditions adequately can be challenging. Although pain and depressive symptoms often may stem from chronic conditions and long-term injuries, pain and depressive symptoms are modifiable (11–13).

Disparities in receiving pain management care and mental health care are further exacerbated among underrepresented populations with identity intersectionality. Fewer African Americans with depressive symptoms seek mental health treatment compared to the general population (14,15), and compared to their non-Hispanic White counterparts, African Americans are prescribed pain medications less often (16–18). Older individuals are less likely to receive pain medications compared to younger individuals for pain-related emergency department visits (19), and older adults have low rates of mental health service utilization (20). Despite the comorbid nature of the conditions, African American women are less likely to receive adequate treatment for these conditions than non-Hispanic Whites and men, respectively (16,21). In addition, in 1 study, African American women with pain and depression reported that their health care providers lacked an understanding of the gravity and impact of their comorbid symptoms (10).

We sought to adapt an existing intervention to address comorbid pain and depressive symptoms in middle-aged and older African American women and test the feasibility and acceptability of this adaptation. Tailoring or testing an intervention *within a group* experiencing health inequities can lead to more effective intervention and better outcomes within the specific group (22). The gap in the literature and the need for interventions and treatments of comorbid pain and depressive symptoms for older African American women represented an opportunity to adapt a proven depression intervention for African Americans, Get Busy Get Better: Helping Older Adults Beat the Blues Intervention, for this population. The Get Busy Get Better (GBGB) intervention is a self-management behavioral activation intervention that has been effective in treating depression in older African Americans (23,24). GBGB is a home-based depression treatment program that serves mostly African Americans. GBGB involves 10 one-hour weekly sessions over 4 months, delivered by licensed social workers. GBGB comprises depression education, care management, referral/linkage, stress reduction, and behavioral activation plans (25,26). Testing GBGB has shown a reduction in depression scores, anxiety, functional disability, and improved behavioral activation levels. We adapted GBGB with input and guidance from older African American women with pain and depression and individuals from the original research team of GBGB (10,27). The adaptations to GBGB included (a) training a nurse as the interventionist, (b) focusing on pain *and* depressive symptoms, and (c) working with older African American women on self-directed goals surrounding pain and depression through behavioral activation. Based on findings from our focus groups as well as the inclusion of the biopsychosocial mechanisms of pain, we changed the interventionist from a social worker to a nurse (28). Additionally, we named the intervention Depression and Pain Perseverance through Empowered Recovery (DAPPER). Specifically, the women discussed that they liked having empowerment and perseverance as part of the title in the focus groups. The DAPPER intervention is a collaborative effort between the nurse interventionist and participant to incorporate evidence-based nonpharmacological strategies related to education, training, and empowerment to focus on participant-driven goals related to pain and depressive symptom management. The purpose of this study was to test DAPPER as a 12-week behavioral activation intervention. The objectives were to (a) assess the feasibility and acceptability of the intervention at the participant level and (b) gauge the initial effect size on outcomes of pain and depressive symptoms.

Conceptual Framework

Self-regulation theory is the theoretical framework for this study. Self-regulation theory involves 2 tenets: (a) participants manage their response to situations based on their experiences (experiences with pain and depression) and knowledge of an event and (b) participants' goals are to maintain comfort and decrease the negative effects of an illness (pain and/or depression) on their lives (25,26). African American women have had experiences within health care, experiences in society, and specific experiences with access and use of pain management strategies that have shaped their responses to their pain and their mental health (10,29–31). In this study, we are testing the feasibility of the DAPPER intervention and working with participants who will set their goals based on their experiences and existing knowledge about pain and depressive symptoms, and their experiences and preferences surrounding treatment. For example, a participant aging with pain and depressive symptoms recognizes that when she works in her garden, she is able to better manage her stress and pain. Her goal may be to participate in gardening as a strategy to alleviate pain and depressive symptoms. Re-engaging in this self-identified, enjoyable activity would provide comfort, decrease the cumulative effects of these conditions on her functional ability, and potentially improve overall symptoms experienced.

Research Design and Methods

The study design is a randomized waitlist control study: Participants randomized to the waitlist initially served as the control group. Following their second data collection, they then received the intervention and were able to contribute pre–post data.

Recruitment and Randomization

The study sample was recruited through multiple methods: (a) in-person recruiting (eg, conducting blood pressure and

health screening events at senior residential communities within Baltimore City); (b) contacting participants enrolled in previous research studies; (c) mass flyer marketing at relevant community sites (eg, churches, senior residential communities, and other established community-based partner agencies of the Johns Hopkins School of Nursing Center of Innovative Care in Aging, the Johns Hopkins Center for Health and Aging, and the Johns Hopkins Geriatric Services Frailty Registry); and (d) sending electronic recruitment messages through MyChart online health care portal to patients whose demographics match study inclusion criteria.

Participants were eligible for the study if they (a) self-reported pain greater than 3 out of 10 that has lasted longer than 3 months and keeps them from doing at least 1 enjoyable activity, (b) self-identified as an African American/Black female, (c) were living in the community, (d) scored a 5 or higher on the Patient Health Questionnaire-9 (PHQ-9) depression screen (assessed 2 times during a 2-week period), (e) were pre-frail or frail, (f) reported at least 1 activity of daily living or instrumental activity of daily living limitation, and (g) self-reported being 50 years of age or older. Exclusion criteria included (a) being hospitalized more than 3 times in the last year, (b) participating in physical therapy, (c) having a terminal diagnosis (<1 year expected survival), (d) having severe cognitive impairment based on the Short Portable Mental Status Questionnaire (32), or (e) being unable to understand or speak English.

Trained data collectors screened and assessed interested persons who provided informed consent at baseline. Once baseline data collection occurred, the study coordinator randomized participants to either the immediate intervention or waitlist control group. Randomization was computer generated using block randomization of four. The Study Coordinator then contacted the participant to inform them of their group assignment.

The DAPPER Intervention

The first step in adapting GBGB was to hold focus groups with older African American with pain and depression (33). Within these focus groups, we explained GBGB and asked participants questions about their experiences with various pain management strategies, their perceptions of the GBGB intervention and their thoughts about adaptations (eg, number of visits, interventionists, etc.) (10). Themes from the focus groups were used to guide us in adapting the GBGB intervention. We also adapted the intervention training manual from GBGB for the DAPPER intervention. We included content on pain and communication with health care providers. We also changed the number of intervention visits from 10 to 8 due to participant feedback. We provide further details of the adaptation process elsewhere (34). The nurse interventionists and all research staff attended a 2-day training from a trained facilitator from GBGB. Any new research team members who joined after the initial training watched the training videos and read the intervention manual. We obtained approval from the Johns Hopkins Internal Review Board (IRB00226182) on December 11, 2019. The study was registered with ClinicalTrials.gov (NCT04091347) on September 13, 2019. Due to coronavirus disease 2019 (COVID-19) in 2020, the study was delayed for 9 months. The intervention was originally designed as an in-person intervention; however, adaptations to the protocol were made in 2021 to include virtual options for data collection visits and nurse visits.

The nurse visits focused on self-management and were guided by self-regulation theory. The nurses measured readiness to change at the beginning of the intervention and guided the participant through behavioral activation techniques to improve the sustainability and acceptability of the self-management strategies (35). The nurses used the Readiness to Change Scale to measure readiness to change (36). This scale includes 4 levels: 1—pre-contemplation, 2—contemplation, 3—preparation, and 4—action and maintenance. This allows nurses to identify where participants are on this scale and determine how to move forward in goal setting and strategies. If participants did not move to Level 4 by the third visit, the nurses would identify barriers and facilitators and identify areas the participants may be ready to take action and focus on those areas. The visits were in person until COVID-19. When the study resumed after COVID-19 delays, the participants were able to choose in-person nurse visits or virtual visits based on their preference.

The participants set goals surrounding pain and depressive symptoms and other areas they deemed important. The nurses worked with them to use evidence-based strategies to address their goals (25). Participants set goals at the first or second nurse visit. Subsequent visits were focused on tailoring strategies to the context of the individual and their environment to work toward achieving set goals. Goal assessments were conducted at Visits 4 and 8. In order to maintain fidelity, all research team members participated in either live training from the GBGB Research Team or watched a recording of the training. All research team members were responsible for adhering to the study's intervention manual. Ten percent of the nurse visit sessions were audio-taped in order for another research nurse on the team to listen to the recording and complete a fidelity checklist. We did not identify any checklist deficiencies in the audio-recorded nurse visits.

Retention

During the period from baseline to 12 weeks, participants in the waitlist control group received up to 3 phone calls from the Study Coordinator. These phone calls were to promote continued engagement of waitlist control participants prior to starting the intervention. The Study Coordinator asked, "How are you doing?" which resulted in responses related to health, wellness, and general happenings. Phone calls ranged from 5 to 20 minutes in length. We also confirmed contact details and reminded participants about the research study. Participants in both the intervention and waitlist control group were sent postcards during the New Year holiday to thank them for their participation in the study over the past 2 years. Postcards were sent to assist with retention of participants in both the intervention and waitlist control groups.

Measures

Data collection visits occurred at baseline, 12 weeks, and 24 weeks. We asked demographic questions of the participants that included age, education, income level, ethnicity, and taking pain medications or medications for mood. Pain intensity was measured using a self-reported pain score over the last 7 days, measured from 0 (no pain) to 10 (worst pain). Scores range from 0 to 10 and higher scores indicate more intensity. We also included 2 additional measures for pain at the first and last nurse visits, which were the Pain Behaviors and Global Pain Intensity tools. Pain behaviors were measured using the Patient Reported Outcomes Measurement

Information System (PROMIS) Pain Behavior Scale (37). The 7-item PROMIS Pain Behavior Scale measures self-reported behaviors that are related to pain in the last 7 days (eg, When I was in pain, I became irritable), where higher scores indicate more pain behaviors (37). We also measured pain intensity using the PROMIS Pain Intensity Scale that is used to measure pain at its worst, average, and current levels in the last 7 days on a 1–5 scale, with higher scores indicating more pain intensity (38). Depressive symptoms were measured using the PHQ-9. The PHQ-9 includes 9 questions related to the DSM diagnostic criteria for major depression (39). PHQ-9 scores range from 0 to 27, with higher numbers indicating increased depression severity. Frailty as inclusion criteria was measured using the Frailty Phenotype pre-COVID-19; however, to remain consistent, we changed the measure to the Frail Scale after the start of COVID-19, which was used for in-person and virtual visits (40,41). The scores of the Frail Scale range from 0 to 5, with scores of 0 indicating robust status, 3–5 indicating frail status, and 1–2 indicating pre-frailty. We measured comorbid conditions using the Charlson Comorbidity Index (42). A final Charlson Comorbidity Index score is compiled; higher scores indicate more chronic conditions and increased risk of mortality with scores greater than or equal to 5. Goal attainment was measured by self-report from participants if their goals were determined to be not met, partially met (some aspect of the goal was achieved, but not completely), or fully met. All outcomes were collected at the 3 data collection time points. The approach we used to measure goal setting was modeled after other successful self-management interventions in the literature (43,44). Goals were directed by the participants and focused on their personal priorities, strengths, and deficits.

Feasibility was examined using rates of recruitment, retention, and completion of the trial. These rates were assessed both by group and across the sample. We conducted follow-up assessments with 10 participants after they completed the DAPPER intervention to assess acceptability. We selected participants to attempt to get a range of participants who were on waitlist or intervention group, virtual and in person, and by interventionist. To measure acceptability, we selected participants who agreed to continue to do other activities with the study upon completion of nurse visits. Participants were asked about their experience in the program (eg, "Overall, what was your impression of the DAPPER interventions?" "What was the most valuable or useful?" and "What was the most challenging about participating?") and any changes they would recommend. The study coordinator conducted the follow-up acceptability assessment with participants. All follow-up assessments were conducted over the phone.

Data Analysis

We conducted all quantitative analyses using Stata 16. First, we conducted exploratory and descriptive analyses for baseline and demographic characteristics. Due to the later addition of the baseline education and income questions, we anticipated a greater amount of missing data. Regarding goal achievement, the achievement was assessed by the nurse interventionist during the final study visit and denoted as "Achieved," "Partially achieved," or "Not achieved." Outcomes related to goal achievement were assessed using descriptive statistics.

Finally, to examine the feasibility, we ran descriptive statistics to report percentages of retention. Acceptability was summarized using basic content analysis of the follow-up acceptability assessment questions (45). We used chi-square and independent *t*-tests to compare baseline and demographic characteristics of the immediate intervention and waitlist control group. We used intention-to-treat analysis with all participants counted in their randomized, assigned group (immediate intervention, waitlist control) (46) There was a 12-week comparison of change between the 2 groups. For daily Pain Intensity score and PHQ-9 score, we used a generalized estimating equation to assess the interaction between time and treatment with an independent working correlation. For these primary outcomes, effect sizes were estimated based on Hedges' *g*, which is recommended over Cohen's *d* to correct for an upward bias in small sample sizes (47). Effect sizes were classified as small (0.20), medium (0.50), and large (0.80).

Third, we pooled the groups to compare scores pre-intervention versus post-intervention. For the outcomes of Pain Intensity and Pain Behavior, we calculated the mean difference in *t*-score between the 2 time points using a paired *t*-test statistic. Significance was set at p value of <.05.

Results

The average age of the 34 participants was 64.8 (standard deviation [*SD*] = 10.5) and all self-identified identified as African American women and not Hispanic or Latina. Although there was a large amount of missingness for the education and income variables, the majority of participants with education and income data had at least some college (n = 6, 42.9%) and had an income of less than $30,000 per year ($n$ = 10, 71.4%). A total of 73.9% of the participants were taking medication either prescribed or over the counter for pain and 34.8% were taking medicine for anxiety or depression (n = 8). The average daily pain score was 7.0 (*SD* = 1.9), and the average depression score was 11.9 (*SD* = 4.0). See Table 1 for a full description of sample demographics.

Figure 1 is a CONSORT diagram that outlines our recruitment and retention for the study. Of 129 individuals screened, we enrolled and consented 34 (26.4%) women. Of the 34 women, 7 women withdrew prior to starting the intervention. Of those 7, only 1 participant (3%) was randomized but did not complete baseline surveys. Of the 23 participants who completed the intervention, 13 had their nurse visits in person, 8 had virtual visits, and 2 had both in-person and virtual visits (ie, hybrid). A total of 4 women are currently enrolled in the intervention and had to pause visits or have had extended periods of time during visits due to various circumstances (eg, changes in living situations or extreme financial concerns).

Goal Outcomes

Of the 23 women who completed the intervention, 20 women set 3 goals, 2 women set 2 goals, and 1 woman set 1 goal during the program, for a total of 65 goals set or an average of 2.8 goals per person. Of the 23 participants who completed the intervention, participants self-rated 55.8% goals as fully achieved (range: 0%–100%) and 32.6% partially achieved (range: 0%–66.7%). Across all goals set, the "not achieved" rate was, on average, 11.6% (range: 0%–100% per participant) of goals set. Twenty-two women (95.7%) achieved or partially achieved at least one of the goals they set in the program. See Table 2 for examples of goals and respective strategies used to work toward those goals.

Table 1. DAPPER Participant Demographic Characteristics and Outcome Scores at Study Baseline, *N* = 34

Demographic Characteristic	Total (*N* = 34)	Immediate Intervention (*n* = 17)	Waitlist Control (*n* = 17)	*p* Value	Missing (*n*)
Age,* Mean (*SD*)	64.8 (10.5)	64.9 (11.0)	64.6 (10.3)	0.95	0
Highest level of education completed,† *N* (%)				0.57	20
No formal education	0 (0)	0 (0)	0 (0)		
Some education (less than 12th grade)	1 (7.1)	0 (0)	1 (14.3)		
Completed 12th grade/high school or GED equivalent	0 (0)	0 (0)	0 (0)		
Trade/vocational school	1 (7.1)	1 (14.3)	0 (0)		
Some college	6 (42.9)	3 (42.9)	3 (42.9)		
Bachelor's degree or higher	6 (42.9)	3 (42.9)	3 (42.9)		
Race, *N* (%)					0
Black or African American	34 (100)	17 (100)	17 (100)		
Ethnicity, *N* (%)					0
Hispanic or Latina	0 (0)	0 (0)	0 (0)		
Not Hispanic or Latina	34 (100)	34 (100)	34 (100)		
Annual income,† *N* (%)				0.42	20
$0–less than $30 000	10 (71.4)	6 (85.7)	4 (57.1)		
$30 ,000–less than $60 000	3 (21.4)	1 (14.3)	2 (28.6)		
$60 000–less than $90 000	0 (0)	0 (0)	0 (0)		
$90 000 or more	1 (7.1)	0 (0)	1 (14.3)		
Taking medication for pain,† *N* (%)				0.71	11
Yes	17 (73.9)	10 (76.9)	7 (70.0)		
No	6 (26.1)	3 (23.1)	3 (30.0)		
Taking medication for anxiety or depression,† *N* (%)				0.18	11
Yes	8 (34.8)	3 (23.1)	5 (50.0)		
No	15 (65.2)	10 (76.9)	5 (50.0)		
Number of medical conditions, mean (*SD*)*	3.9 (1.6)	3.8 (1.9)	3.9 (2.0)	0.94	12
Number of activities of daily living limitations, mean (*SD*)	2.7 (1.8)	2.8 (2.0)	2.6 (1.7)	0.87	1
Number of instrumental activities of daily living limitations,* mean (*SD*)	3.2 (1.8)	3.3 (2.1)	3.1 (1.7)	0.84	1
Frail Scale score, mean (*SD*)	2.9 (0.7)	3.1 (0.8)	2.8 (0.6)	0.26	8
Frail Scale categories,† *N* (%)				0.66	8
0	0 (0)	0 (0)	0 (0)		
1–2	7 (27)	3 (23)	4 (31)		
3+	19 (73)	10 (77)	9 (69)		
PHQ-9 score,* Mean (*SD*)*	11.9 (4.0)	12.3 (3.1)	11.5 (4.8)	0.62	3
Daily pain score,* Mean (*SD*)	7.0 (1.9)	6.8 (2.2)	7.3 (1.6)	0.41	1

Notes: DAPPER = Depression and Pain Perseverance through Empowered Recovery; PHQ-9 = Patient Health Questionnaire-9; *SD* = standard deviation.
*Indicates individual *t*-test.
†Indicates chi-square.

Participants set their goals across various categories including pain management, depressive symptoms/mood, social engagement/decrease isolation, exercise, engagement in activities, nutrition, sleep, communication with heath care provider, and finances. The most common category was engagement in activities at 33% (*n* = 21). Engagement in activities ranged from decluttering an upstairs bedroom to making 10 jars of pickles. The second most common goal category was social engagement/decrease social isolation at 23% (*n* = 14). These goals included goals such as getting reconnected to family members or joining a new church/starting social opportunities by the end of the summer. The third most common goal was pain management at 18% (*n* = 11). These goals specifically mentioned improvements in pain management such as reducing my daily pain levels. Depressive symptoms/mood symptoms represented 10% (*n* = 6), such as better managing my emotions and depressive symptoms. There was only 1 goal for each of the categories of sleep, communication with health care providers and finances. Nutrition also represented 11% (*n* = 7) of the goals and increasing exercise represented 9% (*n* = 6). Some of the participants' goals counted for 2 categories. For example, 1 participant stated her goal was to reduce

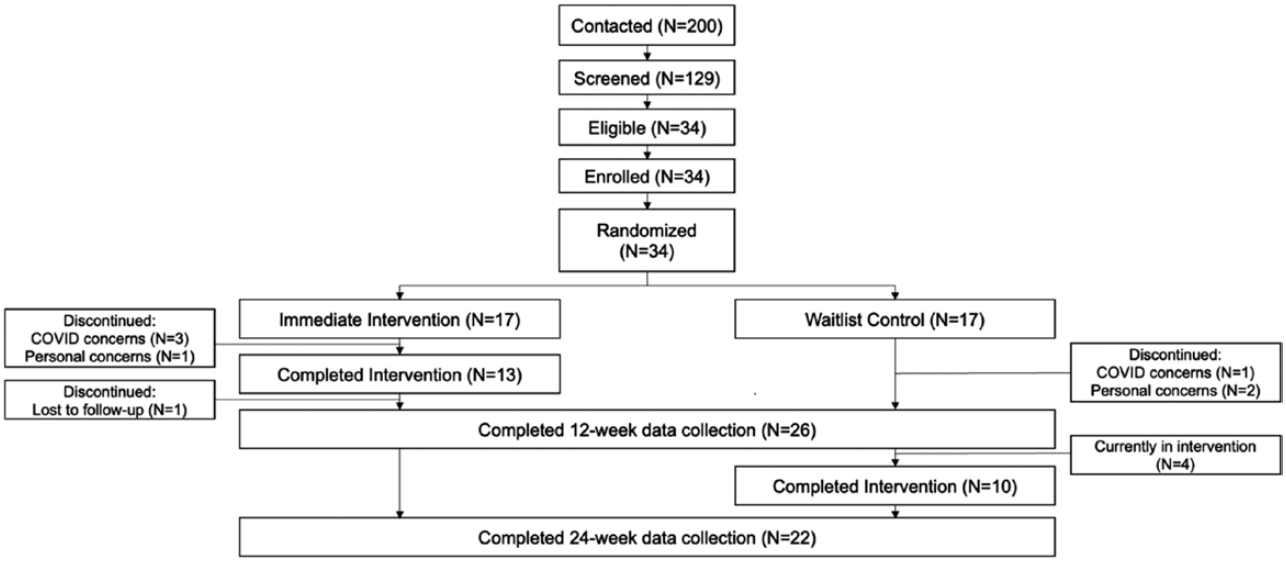

Figure 1. CONSORT Diagram for DAPPER study. DAPPER = Depression and Pain Perseverance through Empowered Recovery.

Table 2. Examples of Goals Set by Participants During the Depression and Pain Perseverance through Empowered Recovery Program and the Strategies for Goal Achievement

Examples of Goals (category)	Outcomes	Strategies
Better manage pain and get it down to a 5 (Pain Management)	Participant was given a Transcutaneous Electrical Nerve Stimulation (TENS) unit and taught how to use it. Participant also given extra-long heating pad and small disposable heating pads for hands. Participant stated average pain was no longer severe and below 5.	The participant and the nurse worked together to determine to come up with a plan of using the TENS unit and heating pad at specific times when pain was more likely to increase.
Improve eating habits, decrease eating after midnight (Nutrition)	Participant stated this goal was met and she had eliminated eating after 8 p.m. She also stated she was finding it enjoyable to eat healthier options and had less gastric reflux episodes.	The nurse assisted the participant with reviewing and documenting habits in the evening to create a schedule to eliminate late night eating. The nurse also worked with the participant to find healthier snack alternatives.
To get out the house more and to participate in a social event at least once every 2 wks (Socialization)	Participant engaged in various social events such as jazz festivals, tennis matches, and beach trips. On weeks she did not have a social event, she went on a walk in her neighborhood during her lunch break.	The nurse and participant used behavioral activation exercises to determine activities that she wanted to engage in. A planner was purchased to help the participant manage and schedule her social events.
To better cope with death most days of the week (Depressive Symptoms/Mood)	Participant expressed readiness to talk with a mental health professional about her feelings of loss.	The nurse coordinated contact between the participant and a grief counselor who can help her process her losses and develop coping strategies.
To drive at least half of the duration of road trips longer than 4 h (Activity)	Participant was able to drive 3 h on each leg of her road trip.	The nurse provided participant with a cordless heat pack that helped reduce pain on long car rides and increased her confidence and ability to drive long distances.
Improve communication with primary care provider regarding alternative therapies (Communication)	Goal was met in discussing alternative therapies with primary care provider.	The nurse discussed various methods of communication that the participant could utilize in communicating with primary care provider. The nurse also brainstormed alternative therapies with the participant to review with provider before next visit.

pain by increasing exercise and flexibility, which we categorized as a pain and exercise goal.

Feasibility and Acceptability Outcomes

Of the 34 consented individuals, 28 started the intervention (82.4%) and 23 (82.1%) completed the intervention. One participant withdrew after starting the intervention (ie, "having too much going on personally and health-wise"), and 4 participants are in the process of completing the intervention. Of the participants that withdrew from the study prior to receiving the intervention ($n = 6$, 17.6%), the primary reasons were concerns regarding COVID-19 exposure ($n = 4$), "having too much going on personally and health-wise" ($n = 1$), and health complications ($n = 1$). We originally set a goal of a 13% attrition rate at the 12-week follow-up based on GBGB and other well-established behavioral interventions among community-dwelling older adults (48,49).

From those who consented, we had a 32.4% attrition rate. From those who started the intervention, we had a 17.9% attrition rate.

Of the 10 participants interviewed, all participants responded positively about their experience in the program. Overall, participants answered positively to the first question ("What was your impression of the DAPPER interventions?"), using descriptors such as, "interesting," "great," "good," and "informative" to characterize their experience in the program. Related to value and usefulness ("What was the most valuable or useful?"), participants cited the tangible aid provided by the study (eg, heating pads, cushions) and intangible elements, such as the qualities of the intervention nurse, being able to reflect on one's medical history and new information learned, and accountability with goals. One participant described her "favorite part" of the program as "actually talking to the [nurse interventionist] weekly." Challenging aspects of the study included technical issues with accessing online forms (ie, intervention materials) and understanding the need for saliva, which was collected as part of the data collection visits and in the process of being analyzed.

Additionally, participants had recommendations for improvements in the intervention. The major change suggested was to include a group component to provide opportunities for participants to interact with each other. Based on this recommendation, we incorporated this question into further interviews and identified that 9 out of the 10 participants interviewed thought adding a group component to the intervention would be beneficial. The following quotations from 2 participants demonstrate support for adding the group component to an adapted version of the intervention.

> A chance to meet, to see your friends and the persons you interact with. A lot of younger people who work, have children, and other things, can't get out to meetings, but they want to be involved with different things, so virtual meetings have really worked well for people like that, and for elderly people, as well. So, it definitely has some very good things about it. And we may be doing it for a while, huh? (89 years of age)

> [I] just think people learn more when it's more than a few, because what one person might not know someone else could have experienced and can enlighten you. (58 years of age)

Other recommended changes included renaming the intervention to be more reflective of their age and gender identities and emphasizing culturally informed training for all members of the study team, including data collectors.

Impact on Pain, Depression, and Frailty From Baseline to 12 Weeks

Baseline pre-intervention survey data were compared with 12-week post-intervention survey data. The full results are presented in Table 3. Improvements were noted for depressive symptoms with a large effect size of –0.95. No improvement was noted for pain with a small effect size of 0.09 in the contraindicated direction.

Although we did not detect an improvement in the Pain Intensity Scale, we did see a change in the mean scores of pain behaviors and PROMIS pain intensity that were measured at the first and last nurse visits. The mean score for pain behaviors pre-intervention was 60.44 (SD = 3.55) and post-intervention 59.41 (SD = 3.62), with p = .24. The mean score for PROMIS pain intensity pre-intervention was 55.43 (SD = 5.05) and post-intervention 52.82 (SD = 6.64), with p = .04.

Discussion

In this pilot study, we found that the DAPPER intervention was feasible and acceptable to most study participants. The participants provided valuable feedback on the intervention and made recommendations for changes. We did not meet our goal of having a 13% or less attrition rate. We estimated a strong effect on 1 subjective measure of depressive symptoms and demonstrated improvement in pain behaviors. This study provides evidence of an intervention targeting pain and depressive symptoms within a group of middle-aged and older African American women.

Overall, 79% of the women who were enrolled participated in the intervention. After starting the intervention, 1 individual of the 28 did not complete it. Of the women who were randomized, we had a 67.7% retention rate; however, those who did remain in the study did complete all 8 of the nurse visits. We suspect that without the significant delays from COVID-19 and the hesitation or concern surrounding participation in the intervention due to COVID-19 concerns played a role in our attrition rates. Furthermore, participants had circumstances related to their health and/or finances that presented further barriers to them participating in the study. We are still completing our 24-week data collection assessments with an anticipated completion date of August 31, 2023. We will consider additional ways to stay

Table 3. Effect Size and Change in Mean Score of Key Outcomes of Depressive Symptoms and Pain Between Groups

Key outcome	Sample (n)		Mean (SD)		"Group × Time" Interaction Term p Value	Effect Size
	Baseline	12 Weeks	Baseline	12 Weeks		
PHQ-9					.09	–0.95
Immediate intervention	16	11	12.25 (3.13)	8.36 (4.43)		
Waitlist control	15	14	11.53 (4.78)	11.43 (4.67)		
Daily pain					.90	0.09
Immediate intervention	16	11	6.75 (2.18)	6.64 (1.80)		
Waitlist control	17	13	7.29 (1.57)	7.00 (1.35)		

Notes: PHQ-9 = Patient Health Questionnaire-9; SD = standard deviation.

in contact with participants between the 12- and 24-week follow-ups.

The majority of the goals were either partially or fully achieved. The categories of participant goals include pain management, depressive symptoms/mood, social engagement/decrease isolation, exercise, engagement in activities, nutrition, sleep, communication with health care provider, and finances. The most common goal was in the area of completing or engaging in specific activities such as decluttering a room. These goals did not fall under the categories of pain or depressive symptoms; however, they reflect areas that are important to the participants. These are potential activities that participants may not have been able to accomplish due to their pain and depressive symptoms. If these goals were met, it is likely that pain and depressive symptoms would improve. Further analysis in a larger study is needed to tease out the relationships of goals to pain and depressive outcomes. Overall, the goals participants set were areas important and valuable to them. The participants determined their goals, and the role of the nurses was to help them achieve these goals. The strength of a self-management behavioral intervention centered on participants' goals in multiple areas can be addressed simultaneously, which may improve the quality of life in middle-aged and older adult populations (43).

We identified in the post-intervention assessment that participants found the intervention helpful, enjoyable, and expressed improvements in their mood and pain. Participants also recommended having a group component of the intervention. We believe participants desired a social connectedness to others who were experiencing this pain and depressive symptoms. Having this interaction and engagement could provide encouragement. Considerations for improvements or future interventions include having a group component, which mainly increases connectedness and participation in the study. In addition, adding social workers to the research team may provide a resource for participants who experienced financial strain or food insecurity, which may increase retention rates in the study. Social workers were also very effective as interventionists in GBGB; therefore, it would likely strengthen the study if they were added to the team.

Although we did not detect a significant difference in quantitative improvements in pain in the intervention, participants did describe improvements in pain management in their goal setting. Findings from previous studies addressing pain outcomes in older adults who are frail have been mixed (50,51). The intervention was adapted from GBGB, which showed significant improvements in depression, daily function, and activation (52). There is the possibility that we did not see improvements in pain intensity due to increased physical activity and increased awareness of their pain. Nonpharmacological therapies may require more time to show effectiveness and benefits to pain than pharmacological strategies (53). Pain behavior scores, overall, did decrease after the last nurse visit, which may demonstrate participants' responses to their pain and perceptions of their pain were changing. In addition, the PROMIS pain intensity scores decreased, which demonstrates that their average daily pain and pain at its worst level had decreased after the last nurse intervention. Using a multimodal approach that involves physical interventions as well as cognitive behavioral techniques may be more effective in treating various types of pain and co-occurring depression in older adults (54). Incorporating this multimodal approach into the intervention may more effectively address both pain and depression in this population (3,55).

Implications

There are few interventions that specifically target pain and depressive symptoms in middle-aged and older women. Individuals who experience comorbid pain and depression experience reduced physical, mental, and social functioning in comparison to those who experience only depression or only pain (3). Ensuring that interventions are person directed may improve motivation, health promotion, and sustainability (43). Objective measures of interventions are important in showing effects; however, subjective measures such as goal outcomes ensure that participants are at the core and are engaged in their care. Future work can also take into account pain catastrophizing and the role it may play in how the women engage and are affected by their pain (56). The findings of this study have led us to adapt the intervention to include a group session that involves a form of cognitive behavioral therapy. We will also continue to strategize ways to improve the sustainability of the intervention through community partnerships and health system collaborations. Testing this intervention in a larger efficacy trial may lead to more information on how to manage both pain and depression in older African American women. Interventions that successfully address pain and depression serve as models that can be integrated into the health care system or potentially provide options for referrals for older patients in need of pain management and mental health therapy.

Our findings show support for the necessity of assessing both pain and depressive symptoms in older adults. Specifically, with regards to pain assessment, our findings also show the importance of assessing more than pain intensity on the 0–10 scale but assessing pain behaviors, responses, and mood (57–59). Treatment of both conditions concurrently has important health implications for older women as they age. Effective interventions addressing pain and depression in older African American women who are frail have the potential to improve their quality of life and independence. Adequate pain management and improved mood could also increase their social participation, well-being, and limit preventable health care utilization.

Limitations and Strengths

There were several limitations in the proposed study. First, this pilot study was not powered for formal efficacy testing. The findings are not generalizable to a general population and additional evaluation of the intervention is needed. Second, the missing data and attrition are also limitations of the study that were largely driven by the COVID-19 pandemic. This has implications for testing the intervention in a larger trial. Third, although we screened participants if they had pain that interfered with their abilities to do things they enjoyed, we did not measure pain interference in reference to their physical function or mobility. This is a limitation given it could provide information about how much pain may have interfered with pre- and post-intervention physical function and mobility, and these were common areas of goal setting. Despite the limitations of the study, there were several strengths. This is the first study to our knowledge that tests a behavioral intervention to treat both pain and depressive symptoms in older African American women. Second, the intervention was

tailored from a previous evidence-based intervention. Third, the intervention is tailored to each person; however, it is repeatable, standardized, and manualized. We also addressed all types of pain in this study and did not focus on 1 specific type, which gave us an opportunity to be inclusive of multiple pain experiences and strategies for intervention. Lastly, this intervention was participant driven, meaning they set their own goals and worked toward them in ways that were conducive to their preferences and environments.

Conclusion

Despite the complexity of treating pain and depressive symptoms in middle-aged and older African American women, there is potential to effectively treat both conditions. Findings from this pilot study provide further evidence supporting the use of nonpharmacological techniques to intervene in the cycle of pain and depression among older African American women. Their suggestions for future iterations of the intervention highlight the benefit of participant feedback.

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Conflict of Interest

The authors of this manuscript have no conflicts of interest to report.

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